

Bently Nevada systems don't cost ... they pay

A U.S. refinery installed a Bently Nevada machinery management system throughout its plant. It monitors 60 small pumps that were selected based on their criticality. The system was installed in a way that would permit a future expansion of the remaining pumps in the refinery. When it came time to proceed with the anticipated expansion, it was necessary to provide project justification by measuring the initial system's return on investment (ROI). Upon detailed evaluation, the refinery concluded that the machinery management system had resulted in savings of over USD 1,500,000 in less than a year, for a return on the refinery's initial investment exceeding 400%.

Among the specific instances of noted savings, the system indicated high vibration on a Second Stage Charge Pump. Subsequent inspection revealed the coupling on the clutch had come loose and was beginning to be damaged. The early identification of the problem resulted in a net savings of USD 250,000 by preventing a Power Recovery Turbine failure, therefore avoiding a one-day hydrocracker shutdown. In another instance, the system indicated high vibration on a Coker Charge Pump, after which inspection revealed that the impeller was plugging with coke. Operations used the machinery management system to optimize back flushing for the pump, extending its life cycle from four to six months. Maintenance cost savings to the refinery in this case are USD 45,000 annually by eliminating one pump failure per year. Needless to say, the system expansion was easily justified.

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A U.S. refinery installed proximity probes on a generator experiencing increased electrical demand and running at its design capacity. However, proper transducers were not initially added to the gearbox. Frosting of the gears was later discovered and was most likely caused by a loss of lube oil in a previous incident. Had the transducers been present on the gearbox, the loss of lube oil could have been detected before

gear damage occurred. It is estimated that approximately USD 350,000 would have been saved in repairs.

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A U.S. oil exploration facility had installed a Bently Nevada machinery management system on several of their essential pieces of rotating machinery. After failure of an air compressor motor not initially included in the machinery management system, the motor was reinstalled and transducers placed at each bearing. Some time later, the system detected characteristics of another impending failure, which allowed for planned (not emergency) repair, and resulted in approximately USD 100,000 in averted repair and maintenance costs with a return on the exploration facility's initial investment of more than 50%.

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As part of startup testing on a new gas turbine generator, a U.S. crude oil production facility tripped the machine at 4 MW load. The test program continued with a fast restart. However, as the load reached 9 MW, the machine shut down on high load gearbox casing vibration. Amplitude versus time trends from the Data Manager® 2000 system included in the project showed an increasing vibration amplitude for approximately 5 minutes before the shutdown occurred. The high vibration was attributed to distress at the tooth mesh, which resulted from thermal transients caused by the very rapid shutdown and restart sequence. The Bently Nevada vibration monitoring system prevented possible damage to a gearbox resulting in a potential savings of USD 250,000. The Data Manager® 2000 system contributed to the root cause analysis. 